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# USSR Report

ENERGY

No. 34

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20 October 1980

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## ELECTRIC POWER

### PROBLEMS AT SOUTH UKRAINE NUCLEAR POWER STATION GIVEN

Kiev RADYANS'KA UKRAYINA in Ukrainian 23 Jul 80 p 2

[Article by V. Martynov, instructor, Nikolayevsk obkom of the Ukrainian Communist Party: "Delays in the Mainstream"]

[Text] The South Ukrainian nuclear power plant is being erected at a picturesque bend on the Southern Bug River in the Nikolayevskaya oblast. Work on the high pressure goals of the five-year plan is proceeding under full steam. Thousands of cubic meters of monolithic and modular reinforced concrete have been poured, 15,000 tons of metal structures have been put up and 27,000,000 cubic meters of soil have been graded. Several important industrial, living, cultural and general-purpose facilities have been put into operation and residential homes have been built.

But the situation now has become extremely tense. The plan for the first six months of construction and assembly work was not completed. Construction on the reactor building, machine room, special vessel, block pump station, hydrotechnical and other facilities has been allowed to fall nearly two months behind the schedule approved by the USSR Ministry of Energy and Electrification.

As before, State Construction has no problem in providing the builders with technical documentation and equipment. The Kharkov division of the "Teplo-elektroproyekt" institute has been systematically cutting down the time necessary for output of planning and estimate documents. Suffice it to say that until now builders have been receiving supplements and indications on changes in technical documents and the plan for the current year. In June alone, documentation came to over 1,000,000 rubles, but only 23 percent of the 1981 plans have been published. As a result, many additional materials had to be requested, disturbing the established order.

Glavnoenergokomplekt of the USSR Ministry of Energy has not resolved all the questions concerning the provision of equipment for construction facilities. Orders for manufacture for the first power plant have yet to be placed. The delivery periods contracted with suppliers for other kinds of equipment make it impossible to assemble them this year. The lack of high and low pressure pipe, which is supplied by the "Energomash" plant of Belgorod and the Dneprodzerzhinsk plant of auxiliary boiler equipment and pipe, is creating serious difficulties for builders.

Even with full readiness of the prime facilities, the reactor can not be started up unless work is completed soon on engineering facilities. These include the following: chemical water purification, block pump, water supply and effluent structures, central repair shop etc. Subdivision managers of organizations which remain at these facilities, especially members of the associations "Teploenergomontazh", "Elektromontazh", "Donbasenergobud" are not active enough, not achieving close interaction and business-like cooperation with their neighbors, not taking steps to increase the number of workers and increased rates of construction.

As concerns the schedule of the Ministry of Construction Management "Dniprobud", called for 300 men in June, but in fact 72 men came for construction work. Instead of 200 men, only 16 worked in the "Pivden-teplomontazh" section; only 46 of 190 men reported to the "Teploenergomontazh" section.

The situation at the "Teploenergomontazh" is cause for particular alarm. It goes without saying that the lack of high and low pressure pipe seriously hinders the work of the crew. But the section is voluntarily assembling equipment on hand. In the past three months, only 30 percent of the conduit connection operations in the turbine condenser have been completed. If there were good organization of labor, advanced work technology, this amount of work could already have been completed.

Sanitary technical operations and laying of the main conduits are being carried out by the section "Donbasspetsenergomontazh". With the arrival of V. Bakhov, a new section chief, business is picking up considerably. The crew is starting to sign up in the laying schedule. But it takes a lot of effort to lay 45 kilometers of different pipes before the autumn rain begins, to arrange the section in residential villages for timely preparation of living quarters for winter.

A positive example of work organization in the startup facility can be the crew of the chemical purification section. Work is going on there in three shifts. Section management is not awaiting formal orders, is selecting work volumes to match available workers. The crew of the section "Donbasenergobudmekhanizatsiya" is also working harmoniously. Over 80 percent of the work on the Tashlik Dam, other than construction, is being completed by the brigade contract method.

Success in construction today depends, to a large extent, on the work of the general contractor. But the construction management permitted major work to fall six months behind schedule. Its managers did not smoothly organize production and delivery of units for assembly. Assembly of the top tiers of the reactor vessel sheath are lagging behind. The administration and its No. 1 industrial section are sluggishly working to complete the base of the power supply division.

The oblast party and komsomol support staff, established by the oblast committee of the party and the USSR Ministry of Energy and Electrification, is in charge of construction. The staff worked out specific measures for construction of the Southern Ukraine AES in 1980. Assistance is planned to construction engineers and the board of directors of the AES.

The tasks of the party organizations of constructors and engineers of the station have been discussed at meetings of the active members of the oblast and state party. The adopted resolution sets forth measures for accelerating the pace of construction of the AES and social and general structures. Now it must be done, and with high quality.

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## ELECTRIC POWER

### VVBK-500 OVERHEAD SWITCH TESTED

Leningrad LENINGRADSKAYA PRAVDA in Russian 5 Aug 80 p 2

[Article by A. Travin: "Contact Reliability"]

[Text] The laboring contribution of the Leningraders to the development of domestic power engineering has been great. One of the main ingredients of this contribution is the high-voltage equipment created at the Elektroapparat association. This equipment efficiently, dependably, and without interruption carries its service to the open power switchboards of hydraulic and thermal electric power stations. These are the Bratskaya, Ust'-Ilimskaya, krasnoyarskaya, kostromskaya, and Sayano-Shushenskaya stations. The developers of high voltage equipment rightly consider the delivery of equipment for the Ryazanskaya GRES to be the most important task today. The station represents a qualitatively new stage in the development of Soviet power. The first industrial MGD[magnetohydrodynamic] block, which will consist of a 250-megawatt MGD generator and an ordinary steam turbine, will be used here side by side with series machine units. This new method of obtaining electric power will make it possible to noticeably increase station effectiveness. The experience and results obtained in Ryazan are intended to be used in the future at other electric power stations. This is why it is extremely important that the firstborn of this trend in power displays everything that it is capable of, all of its advantages, and the highest possible results. This depends on many things including the equipment which the Elektroapparat collective will create for the Ryazanskaya GRES.

We will discuss VVBk-500 aerial switches. Seven such devices must be manufactured in the final year of the five-year plan. This will be ahead of time, at the highest level--as stated in the socialist obligations adopted in honor of the 26th party congress by the workers, engineers, and scientists of the firm. The task is not easy. The station in Ryazan has made demands on the work of the collective which quite recently would have seemed to be excessively high.

The new switches, with a force of 3,200 amperes, are ultra-high speed. During a critical situation, a short circuit, when huge dynamic loads arise and a tremendous amount of heat is given off, they must switch off the power equipment during a total of four seconds. With such an increased reliability, you would expect that the parameters and weight of the VVBk-500, when compared with earlier model switches, would have to grow but they are less than 50 percent bigger. This permits the GRES builders and installers to implement a super-dense configuration for the open power switchboard and to save much money.

"In our work," the chief designer of the overhead switches N. M. Adon'yev says, "we have broadly used the know-how gained during the creation of the units for the Sayano-Shushenskaya GES which were similar in some parameters and, additionally, we have introduced a number of new improvements. The switches were developed very quickly."

"The first two of them have already been manufactured, have been tested in the laboratory, and have been sent to the customers. And this was not in September, as originally intended, but in the second half of July. The crew of fitters of Gennadiy Petrovich Matveyev from the fifth manufacturing shop had the most direct impact on this."

"If it took about 20 days to manufacture the Sayano-Shushenskaya switches," the crew chief relates, "then we assembled the first VVBk-500 within ten days and the second within a week. And this is together with full regulation, which other collectives earlier became involved in directly at the place of operation, with a full testing cycle."

The high quality of the crew's work permits a significant decrease in installation time--the switch units are in such condition and so set up that one can boldly load them according to the work guarantee of the Leningraders.

How is the collective doing this ahead of schedule? What reserves come into play in fulfilling the intensive pre-party congress obligations?

There is total interchangeability in the crew working on one order. Each possesses the necessary related skills for the assembly, and many have also mastered machine tool professions. Thus the unproductive loss of work time has been reduced to the minimum in the crew. The people here work conscientiously, with total efficiency.

"We do not have any unimportant jobs," Matveyev says. "Every bit of work requires a creative approach. How much time, for example, has the regulation of the electromagnet in series switches been considered by many to be an unprofitable and labor-intensive operation? And when Anatoliy Firsov undertook it, everybody was astonished by the result--it wastes a calculated number of minutes. What happened? It turns out that Firsov improved the design of the lever, and carries out the operations in his own way."

The switches for the Ryazanskaya GRES are complicated and precise devices. During their manufacture the creativity of the crew has been fully displayed--many solutions had to be found right here, in the shop, at the work places. Many useful innovations came about because of Mikhail Stepanov, Yuriy Alekseyev, Anatoliy Zhukov, Vladimir Grigor'yev, and the crew chief himself.

Those who supplied units and completed items to the fitters also worked selflessly. Using the renewed industrial potential, and the possibilities of the new equipment with which the enterprise's machine inventory was enlarged during the years of the tenth five-year plan, the work tempo was increased in the second shop where they prepare welded constructions, in the third where galvanized coverings and brackets are made, and in the other shops.

"Hasn't it always been demonstrated that the workers at times waste so much time in searching for one or another solution?"--the chief of the fifth shop V. A. Gerasimov suddenly asks the question and continues: "for example, the crew is now thinking about how to mechanize the bending of springs, how best to regulate one of the main units of the switch. They try first one device, then another. Do not think of me as a reactionary; I am not against the search for efficiency. However, it is necessary in the given case. Those problems with which the workers are now struggling would not have existed so long if the specialists of the chief technologist's service, headed by D. A. Suz'min, had developed in a timely fashion new devices and patterns for the new switches. However, they spend very little time in the shop and they do not know much about its problems."

How much trouble does the machine shop cause the fitters at times? We have already been waiting a week for valves, pistons, and levers from there. Unfortunately, this is also the typical picture for other parts. In order to make up for the time missed through the fault of the related workers, the assemblers must again work, as the saying goes, by the sweat of their brow to seek where and what they can speed up. Haste is by no means the best helper in this business.

In order to avoid this, it is necessary to improve the organization of labor, and to strengthen the cost accounting and business connections of the subunits. It is important that every reduction in the system of the interrelationships of the shops and services be examined by the firm's

economic managers as an extraordinary incident so that immediate and effective measures can be taken to eliminate the causes restricting production. The party and trade union organizations of the shops and divisions have been asked to display special strictness here. Much depends on them to ensure that each worker clearly pictures the tasks of his sector, shop, subunit, and more actively influences its solution.

Under the developed specialization of production system, the success of each entering collective also depends largely on its interaction with related enterprises. Other Leningrad enterprises are also participating along with Elektroapparat in the creation of switches for the Kyzanskaya TSS. However, their efforts toward the fulfillment of this major national economic order are far from being enough today.

A collective of the Elektrokeramika association is producing high-strength porcelain supporting insulators for the VVM-500. The first two switches arrived at Elektroapparat exactly on schedule although at first there were anxieties over whether the schedule would be met. It is true that the party committees of the two enterprises and their economic managers met frequently during that time. Together they searched for ways to most rapidly fulfill the contracts, and rendered the necessary support to each other. The joint work schedule became an immutable document, and the course of its fulfillment is regularly examined by the partners.

Unfortunately, far from all of the related industries treat business in such a way. The units for the high-pressure containers arrive irregularly from the Izherzhsky Plant Association. The Krasnyy Trezolnik association gave Elektroapparat less than about one third of all rubber mold packings specified for the seven-month period. The Krasnyy Vyborzhets association does not efficiently deliver brass bars and copper tubing. Here is a characteristic example: in accordance with the contract Elektroapparat expected 140-millimeter diameter brass bars in the first ten days of July and received them at the end of the second ten days.

"In such cases we get out of such a situation as we can," explains the deputy general director of the association A. B. Shul'man. "We borrow the required materials if neighboring enterprises have them. When they are not available, the production rhythm slows down and then, when the materials arrive, it is abruptly raised.

Now when the broad discussion of the decree of the party central committee "Socialist Competition for a Fitting Welcome to the 26th CPSU Congress" goes on in the collectives of the Leningrad enterprises, when the active preparation for this important event in the life of the party and nation has been spread everywhere, it is especially important to strengthen the intensity of the struggle for the ahead-of-schedule realization of the tasks of the final year of the five-year plan as a whole, and to be imbued with an increased responsibility for the fulfillment of its orders. The strengthening of the interaction of the related enterprises, the party enterprises, is a substantial step on the road to new successes.

That is why each enterprise must operate efficiently, and produce all of the items on the products list in the time periods stipulated by contract. This is precisely what is required of the production collectives today.

While the material was being prepared for publication, new information arrived from the Elektroapparat association--the third switch in the series has been manufactured for the Rybinskaya GRES. Three more devices will be shipped there in August. Speeding up its pace, the firm's collective, with each passing day, is getting nearer to fulfilling a major pre-conferred commitment, and is making a large contribution to the completion of the construction of a large national economic project. Those collectives whose successful work depends the fate of the crucial order of the five-year plan must proceed in step with Elektroapparat, coordinating the movement toward a common goal with it.

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## ELECTRIC POWER

### PROBLEMS WITH THE CONSTRUCTION OF THE MOLDAVIAN GRES

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 9 Aug 80 p 1

[Article by A. Pamechnyy and M. Livshik of Dneprovsk, Moldavskaya SSR:  
"Behind the Paper Cloak of Excuses"]

[Text] Our attention was attracted to the agenda for the open party meeting "What Hampers Us in Working and Fulfilling the Plan" which took place at the construction project of the Moldavian GRES. In September the station had to turn over for operation the 12th 210-megawatt power block and the 40-megawatt gas turbine. Both projects were carried over from last year. A month and a half remain before turnover and the network schedule hanging in the construction project headquarters depicts very disturbing information. The construction of the hydraulic structures, station center, and the gas turbine fuel pumphouse is lagging by almost three months, and the boiler compartment by a month.

The general contractor is the person of the chief of SMU [Construction and Installation Administration] of the Yuzhenergostroy [Southern Administration for Construction and Installation of Thermal Electric Power Plants] Trust N. Shatilov explains clearly the causes of the lag--breakdowns in the shipment of power equipment, industrial pipelines and other equipment that is necessary. This argument is also largely corroborated by official information from the customer--Moldglavenergo [Moldavian Main Power Supply Administration]. The Belgorodskiy Power Machine Building Plant was in arrears by about 400 tons of high-pressure pipeline by the planned completion date for shipments. The Bagdyskiy Plant had not supplied 300 tons of low-pressure pipeline and non-standardized equipment. The Tashkent association Sredazielektroapparat [Central Asian Electrical Instrument Association] not yet settled, by the way, for the shipments for the block introduced last year, has not sent even one of the 84 electrical panels to the construction project.

"I do not know what they are thinking about in Glavenergokomplekt [Main Administration for Ensuring the Supply of Complete Sets of Power Engineering Equipment of Electric Power Plants, Substations and Networks]," the deputy director for construction of the Moldavian GRES makes a helpless gesture. "Do you think this is the way to deal with a project under construction?"



However, what is remarkable is the evident ease and restraint with which the construction directors pass off these problems. There was a problem in the first quarter? The answer is quite clear! There were no railroad cars--they did not bring the crushed stone. There was a lag in turning over a boiler? The weather in spring was bad.

However, let us return to the party meeting. The reviews for the sector during the first half-year, to put it bluntly, were inauspicious. Only 63 percent of the plan was realized. The proportion of unfinished construction was great. There were delays with the allotment to work front subcontractor--here they were in arrears at numerous projects. As the sector chief A. Ivanov expressed himself in delivering a short report: "earlier this was troublesome, but now it fills one with great alarm."

Has this feeling of alarm appeared too late? Probably, and the speaker himself asked such a question. After a statement about the collapse of time periods, he tried to pass on to an analysis of the causes. However, the analysis, alas, did not come off. The familiar set of reasons had already been clearly examined: little of what happened was our fault, if others would...

In return, everything fit in its place in the speeches of the participants at the meeting.

A. Kozlovskiy, installer: "They said here that we also ruined the quarterly task for labor productivity--we achieved only 91 percent. I say that such a figure is amazing. Look at how and with what we are working at the projects! We do everything, as the saying goes, on our knees. We only hear of small-scale mechanization. Just like we only hear about the administration's chief mechanic, we do not see him at the construction project."

V. Kuznetsov, bricklayer crew chief: "We hear the voices at every meeting: not this, or the other, or a third. We admit it, no. We understand. But we do not understand how to so organize work. We have built the housing of the dining hall building, we have exceeded. You are not operating the crane now. The entire crew and I are carrying 500 tons of mortar and brick by ourselves to the floors."

L. Lyubetskaya, a worker: "Ask any crew what the main reason for idleness is. It is because of the tardy delivery of mortar. They have closed the old plant and have not yet opened the new one. Remember that in October of last year at one of the meetings we asked the chief engineer of the Yuzhenengstroy Trust comrade Fokatilov: when will you start up the new concrete and mortar plant. What did he answer? Within a week! And so much time has already passed, and no result."

V. Shaban, installer: "Undoubtedly everyone has noticed for how long a time we have to invite people to speak after a report. Believe me, it is not because of indifference. When they promise us meeting after meeting to solve the problems, then what point is there in speaking? There is no more confidence in such statements. How long have we had the new party committee secretary? Half a year, think of that. And we have seen him twice at the projects."

In short, the picture appears gloomy. However, it is worth thinking about this now. How often at any new construction projects will they hasten during an explanation of failures to hide the information concerning the non-delivery of equipment and ordered materials? It is impossible, of course, to drop them from the accounts--they can disrupt the rhythm of any construction project. But there is probably another side--no references to the unfulfilled obligations of suppliers will remove the responsibility from the managers to organize work at the projects, to work with the people, and to create proper conditions for them.

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## ELECTRIC POWER

### PROBLEMS WITH THE CONSTRUCTION OF THE TSELINOGHADSKAYA TETS-2

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 24 Jul 80 p 2

[Article by B. Glotov and V. Leshnev: "Stuck in a Mess"]

[Text] They call the Tselinogradskaya TETS-2 one of the major construction projects in the city. It really is of great importance. The oblast center of Bril'skaya is being rapidly developed. Living quarters are growing, new enterprises are appearing, the old ones are being enlarged. The operational TETS is not yet in a state to satisfy the requirements of the city for heat.

The TETS-2 is also of great interest to the specialists. The station is an experimental one. The plan provides for a number of progressive solutions to increase the effectiveness of capital investments. For example, they will purify gas with moist ash traps which are as good as the best domestic electric filters. This yields a savings of 900,000 rubles. Other planned improvements will lower the estimated cost of the TETS by 18.5 million rubles in comparison with the ordinary type.

One would think--where would one want to work if not here. However, this reduction in the costs of the project did not receive an enthusiastic response from the builders. It was the other way around instead. The first power block was put into operation a year late. Now there is a delay in turning over the second one. About two thirds of the planned assets have been acquired for the half year. The general contractor--the construction directorate of Tselingidrostroy/Tselinograd Administration of Hydraulic Engineering Construction--is choking the program. This has become such an obstacle that the related industries cannot circumvent or go around it. For example, for the third month the very experienced crew of A. Kilin from Spetsgidroenergomontazh/Special Administration for the Installation of Hydroelectric Power Plants/ had to do secondary work because the general contractor did not supply precast reinforced concrete for the main work--the construction of a car dumper.

The explanations for the causes of the lag are not notable for their originality.

"The customer is guilty," declares the acting chief of Tselingidrostroy P. Suprunchuk. "We often came across planning discrepancies during the construction, but the TETS-2 management did not even move a finger to solve them..."

A similar claim of charges is heard. It is true that the customer does not always give effective help in solving planning problems. Only there are other much more important reasons for the lag. The Tselingidrostroy managers prefer to hide them behind the cloak of "objective circumstances." However, you cannot hide the obvious.

"There are not enough people," says the deputy chief of the construction directorate O. Belorikha. "We are now doing trivial work there which, as is generally known, the plan does not provide for."

However, why has the necessity arisen to do trivial work? This is dictated not so much by a construction technology which does not permit the omission of petty work, as by violations of technology. A significant part of the petty work is on the imperfections in the first power block complex. This is the very same one which is numbered among those which have been turned over. They had to divert a part of their resources there today--resources which they only have enough of to do the main job.

And the deputy director of TETS-2 for capital construction V. Karyakin saw with our own eyes another reason for the shortage of people. The projects under construction at the complex were abandoned for an hour before the end of the shift. We counted 28 builders. We generally found no one at such "hot" points as sewage structures.

"Unfortunately the people are gradually getting into the habit of arriving at the construction project a little later, and leaving a little earlier"--Vladimir Nikolayevich noted.

As the third cause for the shortage of workers we examined the documents in the TETS-2 administration. The foundations under the hot blast ventilators have been altered three times this year. Many defects had to be repaired at other sectors. A special document file was set up in the administration where they keep formal documents on poorly conducted construction work. The case is swelling with every passing day.

There can be only one conclusion--if you do not look after the maintenance of construction technology and the use of work time, but waste it on the repair of defects, then there will always be insufficient people. It does not pay to hide this undeniable truth behind such objective circumstances.

## ELECTRIC POWER

### PRODUCTION QUALITY CONTROL AT ATOMMASH

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 7 Aug 80 p 2

[Article by M. Tarelkin, Deputy General Director for Quality of Atommash, Volgogradsk: "At the Nuclear Class Level"]

[Text] Not everyone knows how high the requirements are for AES equipment. Therefore I would like to explain this at once--it must operate smoothly for several decades because any emergency shutdown of the reactor for even a small amount of time amounts to a loss of millions of kilowatt hours of electric power. Besides this, it is necessary to burn extra expensive coal, oil, and gas to make up for the stoppage.

There is also another side to this business, besides the economic one. Repair work during a nuclear reactor shutdown causes many complications connected with protecting the health of personnel.

This is why it became clear to all of us from the first days of Atommash that uncoordinated, non-interconnected, or temporary measures will not provide the necessary production quality especially as production is organized while they are continuing to construct the plant. Life and experience prompts the following: to introduce, by stages, KS UKP [complex system for monitoring production quality] without waiting for the construction of all projects.

As a starting point we took the L'vov experience, based on STP's [enterprise standards], which has been approved by the CC CPSU. However, it is a secret to no one that any system divorced from the concrete conditions of the enterprise will not yield the expected result. It was especially important to search for an approach for our plant which was under construction. With this aim in mind we carefully studied the introduction of KS UKP into plants of the industry--the Izhor'skiy, Krasnyy Kotel'shchik (Taganrog), the Leningrad Metal, and the production association Zvezda.

Today when the chief quality inspection committee of Minenergomash [Ministry of Power Machine Building] has decided to consider KS UKP at Atommash [All-Union Planning and Technological Institute of Atomic Machine Building] as operational, it is appropriate, I think, to talk first of

all about the main, conclusive stage of its creation--the development and introduction of a group of enterprise standards. They are based on the basic documents of Gosstandart [State Committee on Standards], Gos-tekhnadzor [State Committee for Technical Inspections]; in short, all of the requirements set forth for AIS's.

We have traveled along the following path: all of the subunits, i.e., those who will also carry them out from now on, have worked out groups of standards for themselves. The main goal is to always know precisely who, when, how and what must be done so that, as a result, the final output will answer all of the requirements of the best world models.

Let us say, the division of the chief metrologist worked up 12 STP's directed at the metrological maintenance of production quality. When the chief welder's administration developed the STP "input control, storage, preparation and distribution into production of welded materials for AIS equipment articles," it fully analyzed the entire flow--from the arrival of materials and their delivery to work places.

It is clear that there could be cases of duplication and disjointedness during the preparation of plant standards by various subunits. A coordinating work group, headed by the deputy general director for quality, was created to oversee this at Atomash. During the past two years we approved 85 already-developed STP projects and saw to the introduction of 60 of them into practice. A reliability division was created to conduct all current business, to provide daily monitoring, and to give instructional help to the services. Its job, as with all monitoring services, is to see to it that the rigid STP requirements are strictly carried out and that they do not remain only on paper.

This is not one of the easier tasks at Atomash because production is carried out in construction and in putting production capacities into operation. That is why by paying paramount attention to work quality, to an increase in the skill of the workers and specialists, and to technological discipline, we are directing the thrust of the new system toward the creation in all of the subunits of an atmosphere of genuinely high production efficiency.

This, as is generally known, is formed with difficulty and not all at once. That is why we have also created a special STP group, as well as an organizational system which will permit us not just to call it into being but to establish it efficiently and effectively.

Special production efficiency commissions, whose duties include daily inspections, have been organized at the sectors. The shop commission inspects once a week and every Monday at 0730 hours the plant commission, headed by the general director, makes its rounds. He is accompanied by his deputies and other leading specialists. Here they critique the situation with the subunit managers and, at the same time, put together a report which includes an evaluation on a five-mark system. In conjunction with this, a work quality coefficient is determined and the managers, if a deviation from the norm is discovered, has his bonus decreased.

Special services collect complaints, information on the fulfillment of orders, technical production preparation schedules, and other data. Starting this year many of these functions have been computerized. Each sub-unit which has allowed a deviation from an STP (there are also undeniably objective reasons), can present a claim. It is examined by the commission on quality and the final word is submitted to the plant day of quality. This is held monthly on the second Monday under the leadership of the general director. There is a demand for total strictness with the violator. In June, by way of example, the chief of VOXNR/militarized guard/ announced production routine violations in the third building while the technical control administration reported on tardy drawing up of formal documents on defects, and cases of the return of products to the non-standardized equipment shop. Since A. Paportnyy is responsible for this building and did not draw the proper conclusions after an analysis on the day of quality, he was demoted. If any collective especially distinguishes itself then the quality coefficient can also increase the unit of output and it can happen that the bonus grows.

The quality staff attached to the Atomash party committee examines the most important questions connected with the introduction of ES UrP monthly. Such staffs have created management and production party committees, and communists have organized quality posts in the shops.

As a result, today more than 98 percent of the plant employees, at first sight, are turning in their production. Since only the final product--an atomic reactor--can receive the state emblem of quality, and its creation takes many years, we have decided to introduce our own standard--the plant certificate of quality for units, parts, technological processes, and operations. Recently the certification commission awarded the first plant emblem of quality to the crew of the steam generator shop headed by G. Mozhayev for carrying out, in an exemplary manner, the initial machining of drum castings. The appraisals of the crew from now on will be increased by ten percent and in a year they will be reconfirmed.

The main thing for us now is the further improvement of the overall system of production quality management. Although it has officially been acknowledged as introduced, this in no way means that all of the organizational problems have been solved. This system, by itself, is already fine because it does not accept hardened forms, especially for enterprises under construction. However, we have to work hard to create new standards for the already-constructed projects where the subunits of the following section are being placed. The main thing is that it is necessary to so improve the mechanism for introducing a progressive system so that the STP's from the very start operate effectively, enjoying the force of law.

This is not one of the easiest things to do because it involves the breaking of set traditions, psychological barriers, and the eradication of formalism. Nevertheless we can say with full confidence that the ES UrP which has already been introduced into the association is a



powerful help today in realizing the motto: "we will build ahead of schedule, we will master ahead of schedule." Mastery means only one thing to us--AES equipment with the very first part must be only of the highest quality or, as we say, at the nuclear-class level.

In issue number 32(84) of the newspaper SOTSIALISTICHESKAYA INDUSTRIYA they also published materials on the socialist competition at Atommash which was starting up at the all-union key construction project as a fitting welcome to the 26th CPSU Congress. The supervisors of the leading crews V. Bododayev, G. Pimenko, and V. Oborovskiy discuss the increased commitments accepted in honor of this important event.

The paper is publishing the speeches of the Atomenergostroy/Administration for the Construction and Installation of Atomic Power Plants/ crew leader V. Ryzakov, the deputy chief of the electrode shop V. Lukerin, and the chief of the production division of installation administration number 11 of the Elektroyuzhmontazh/Southern Administration for the Installation of Electrical Equipment for Electric Power Plants and Substations/Trust V. Petraschik.

The issue features answers to the critical articles of the newspaper, and various information. Suz'ma Volgodonskiy has a regular column "Anomaliya."

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## ELECTRIC POWER

### BRIEFS

ARMYANSKAYA AES--The power workers of the Armyanskaya AES have brought the station's second power block to planned capacity ahead of schedule. [Text] [Moscow EKONOMICHESKAYA GAZETA in Russian No 29, 1980 p 2] 8524

SAYANO-SHUSHENSKAYA GES--The hydraulic builders of the Sayano-Shushenskaya GES have completed the placement of the fifth million cubic meters of hydraulic cement which is half of the amount required to construct the entire hydraulic development. The height of the dam has reached 130 meters. [Text] [Moscow EKONOMICHESKAYA GAZETA in Russian No 29, 1980 p 2] 8524

ARAKS RIVER POWER STATION--Baku, 4 Aug--"Gyz-Galasy"--this is what they will call the hydraulic development which the Soviet Union will create, jointly with Iran, on the border river Araks. "Gyz-Galasy" will be the third stage of the electric power station cascade on the Araks which the two countries are constructing on an equal footing. Receiving its name from the pointed rock of the same name, the hydraulic development will be located 12 kilometers from the second stage of the cascade, downstream of the river. Its installations will help in providing a constant, around-the-clock level of water in the Araks, necessary for systematic irrigation. The hydraulic development complex will have a reservoir regulator with a capacity of 60 million cubic meters of water and two 40,000-kilowatt each electric power stations on the right and left banks of the river. The experience of designing and constructing the first stage of the Araks cascade--the Araks hydraulic development--is being used in these structures. Built close to Nakhichevan, it will most likely serve its neighbors, helping to irrigate significant tracts of land in Iran and Azerbaydzhan. [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 5 Aug 80 p 2] 8524

UST'-ILIMSKAYA GES POWER--Yanchykan(Buryatskaya ASSR)--Power from the Ust'-Ilimskaya GES has arrived at the construction site of the Severo-Muyskiy tunnel, built on the western sector of BAM[Baykal-Amur Railroad]. It was supplied here a year ahead of schedule on the industrial voltage Severo-Baykal'sk-Severomuysk LEP[electric power transmission line]-220. It ran through more than 300 kilometers of tayga, marshes, and mountain passes. During its laying the installers used helicopters to not only install supports but also to unwind wiring. [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 22 Jul 80 p 1] 8524

LENINGRADSKAYA AES--The million-kilowatt third power block was brought to its planned capacity at the Leningradskaya AES imeni V. I. Lenin. After tests it was placed on the LEP-750 connecting Sosnovyy Bor with the Leningradskaya substation. The photograph shows the block control panel of the third power block. [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 9 Aug 80 p 2] 8524

SHAMBSKAYA GES--Sisiyan(Armyanskaya SSR), 6 Aug--Today the second energy block of the Shambakaya GES was put into operation a month ahead of schedule. This major cascade, made up of three stations, has been constructed on the Vorotan River. The GES is earmarked to regulate peak loads. The hydraulic builders helped to bring the station to its planned capacity earlier than the projected time. They had to work under difficult mountain conditions, at a height of almost 2,000 meters. The efficient interaction of all subunits, skill, and the utilization of highly productive technology were responsible for this success. The Vorotanskiy Cascade, which will become fully operational in the next five-year plan, will permit the solution of important economic problems. The developing industrial centers of the republic, where chemical, machine building, metallurgical, and electrical engineering enterprises are being created, will receive their power from it. The electric power supply to agriculture will be improved. [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 7 Aug 80 p 1] 8524

TOMSK POLYTECHNICAL INSTITUTE--How do you make a turbine steam generator block change electrical voltages more quickly? By answering this question, one can raise the block's efficiency sharply and decrease fuel expenditure. The power workers have requested help in solving such a problem from the students of the thermotechnical department of the Tomsk Polytechnical Institute. This was undertaken by G. Starozhuk who proposed a renovation plan in his graduation thesis which will result, if implemented, in a large gain for the state. The graduation thesis of the chemical engineering department student T. Gritsko was adopted by the builders who will now be able to obtain from the slag of the local GRES splendid building materials not inferior in quality to granite and even marble. The institute's students have carried out a lot of work in accordance with the coordination plan of the USSR Academy of Sciences.

[Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 27 Jul 80 p 3] 8524

NEW ELECTRICAL TRANSMISSION LINE--L'vov--The new electric transmission line from the Chernobyl'skaya AES to the Zapadnoukrainskaya substation has been set up with a planned voltage of 750 kilovolts. In spite of the complexity of the route and the bad weather, all of the work was carried out right on schedule. During the construction of this powerful energy river, they used the experience accumulated during the installation of the Vinnitsa(USSR)-Al'bertirsha (Hungary) LEP-750 which a year and a half ago connected the USSR power system with the associated Mir power system.

[Text] [Moscow GUDOK in Russian 1 Aug 80 p 1] 8524



NEW SAYANO-SHUSHENSKAYA GES TURBINE--The turbine builders of the Leningrad Metal Plant association have completed ahead of schedule the manufacture of the fifth turbine for the Sayano-Shushenskaya GES. [Text] [Moscow EKONOMICHESKAYA GAZETA in Russian No 31, Jul 80 p 3] 8524

POWER FROM UST'-ILIMSKAYA GES--Power from the Ust'-Ilinskaya GES arrived at the construction site of the Severomyskiy tunnel constructed on the western sector of BAM. It has been placed on the Severobaykal'sk-Severomyskiy industrial voltage LEP-220 a year ahead of schedule. [Text] [Moscow EKONOMICHESKAYA GAZETA in Russian No 31, Jul 80 p 3] 8524

NIZHNEKAMSKAYA GES--They have begun to install the fourth electrical machine at the Nizhnekamskaya GES. The hydraulic builders have decided to turn over the fourth and fifth units by the opening of the 26th CPSU Congress. [Text] [Moscow EKONOMICHESKAYA GAZETA in Russian No 31, Jul 80 p 3] 8524

DEFENSE OF MINENERGOMASH--The chief of the production administration of Minenergomash [Ministry of the Power Machine Building Industry] K. Bychkov answers the remarks on the report "USSR Industry during the Five Months of 1980" (issue number 25 of our weekly); the newspaper justly criticizes Minenergomash for the lack of delivery of turbines with a total capacity of 1.7 million kilowatts to its consumers. The lack occurred basically because of the unsatisfactory work of the production association Kharkov Turbine Plant imeni S. M. Kirov which did not supply two steam turbines with a total capacity of 1.5 million kilowatts. Presently the association has developed additional measures to speed up the output of turbines and liquidate its backlog. Minenergomash has established control over the manufacture of turbines. [Text] [Moscow EKONOMICHESKAYA GAZETA in Russian No 31, Jul 80 p 12] 8524

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## FUELS

### JET ENGINES POWER GAS-PIPELINE COMPRESSORS

Moscow PRAVDA in Russian 22 Aug 80 p 2

[Article by V. Dinkov, First Deputy Minister of Gas Industry, and A. Igul'ka, chairman of the Commission on Gas Turbines of the USSR Academy of Sciences, Hero of Socialist Labor and academician: "Service on the Ground for Aviation Engines"]

[Text] This year natural-gas recovery in our country will reach 435 billion  $m^3$  which corresponds to 25th CPSU Congress decisions. Let us recall that in 1975 it was 289 billion  $m^3$ . Such an impressive growth in gas recovery during the Tenth Five-Year Plan could have been accomplished only by building a large number of compressor stations and supplying them with progressive, basically new equipment.

The construction of a compressor station with stationary units having a total capacity of 40,000-50,000 kw takes 16-19 months, but a station equipped with units with aviation-engine drive takes only 5-6 months. This advantage greatly shortened the period for introducing the first line of the Orenburg gas complex. This is why experience in using aviation engines that have exhausted their aeronautical service life to transport fuel over gas pipelines provokes special interest.

As is known, aviation gas-turbine engines operate on kerosene. Under ground conditions, the "heart" of the airplane is converted from kerosene to natural gas. This design solution has enabled the creation of gas transfer pumping units in self-contained modular configurations. They need neither a thick foundation nor a compartment of a building.

The small dimensions and weight of the modules enable them to be hauled in assembled form by railroad and highway and by air transport to compressor station construction sites that are poorly accessible. Such mobility yields an additional benefit: if it is necessary to ship a new unit, it is taken from an exchange pool, and the old one is sent to the manufacturing plant for repair. In this case, the compressor station operates without stopping, because a reserve unit is switched into operation.

The lack of water cooling, the potential for self-ignition and other design virtues have proved the efficiency of these units during the most severe winters, when the outside air temperature falls to -56 degrees.

The merits of the gas transfer pumping units with aviation-engine drive have enabled the builders of underground trunk lines, after performing a set of design-development operations, to convert now to completely outfit-  
ted models for all surface structures. This sharply accelerates their construction.

The first industrial gas-transfer pumping units with aviation-engine drive were worked for the first time back in 1974, and already in 1979 about 200 of them were operating at 32 compressor stations. More than 100 units are being erected at other compressor stations.

The high qualities and reliability obtained during operation of the units on the country's linear trunk gas pipelines have defined new directions in their use. The engines are "toiling" at booster compressor stations of depleting fields and helping the stationary gas-transfer pumping units. They are used to pump gas into underground reservoirs while compressor stations with stationary units are being renovated, and so on.

And last year units with aviation-engine drive found still another use--for rapid erection of compressor stations at high-altitude sites. The gas industry was faced with the task of providing the Transcaucasus republics with natural gas from fields of the North Caucasus and Stavropol' in a short time. For this purpose it was necessary to bring compressor stations into the mountains at altitudes of 800-1,800 meters above sea level. The stations were erected and released for operation very quickly--in 5 months, all told.

Right now, as is known, construction of the second strand of the Perm'-Kazan'-Sov'kay pipeline and of the Gryazovets-Leningrad pipeline is proceeding at an accelerated pace. Here also gas transfer-pumping units with aviation-engine drive are being installed.

In greeting collectives of organizations of the gas industry and of builders and installers engaged in erecting facilities for the recovery, processing and transporting of gas, Comrade L. I. Brezhnev said: "It can be noted with satisfaction that a characteristic feature in the activity of the ministries, economic leaders, and party, trade-union and Komsomol organizations of enterprises and construction projects has been a concentration of the attention of the production collectives on a decisive element--the accelerated development and further improvement of large gas complexes in Tyumenskaya and Orenburgskaya oblasts, the Turkmen SSR, the East Asia and other regions of the country....Your initiative and creativity at work in implementing this policy have enabled the pace of recovery, processing and transporting of gas to be built up rapidly."

The total economic effect from introducing gas transfer pumping units with aviation-engine drive into the national economy has already amounted to 15 billion rubles during the Tenth Five-Year Plan.

An important Gosplan initiative in introducing the aviation-engine units that are in operation should be noted. As these units exhaust their aviation service life, they will all serve the national economy in a new way. Moreover, monitoring the annual increase in the service life of the aviation-engine drives has now been organized.

We consider that the designers' collective that is carrying out the work, "The Creation of a Basically New Containerized Module for Gas Transfer Pumping Units and the Introduction Thereof into the Gas Industry of the USSR," has been presented for competition for the USSR State Prize for 1980 with complete justification.

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## FUELS

### SEMI-SUBMERGED DRILLING PLATFORM NEARING COMPLETION

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 14 Aug 80 p 6

[Article by A. Alekseyev: "A Drill Rig Goes to Sea"]

[Text] A powerful tug puts out to sea, trembling just a little on a steep wave. And following it, chained by thick steel ropes, floats a cyclopean structure. Enormous columns, each almost 10 meters in diameter and the height of a 10-story apartment building, in rows of three, rest on the bottom of two gigantic barges. It was as if the six-legged elephant which, as was believed in ancient times, holds up the earth, had clambered up on a mythical tortoise. But instead of the earth, this here is a spacious multitiered deck about 79 meters long and 61 meters wide--almost a whole football field! An open-work drilling tower, which leaps to a height of a hundred meters, crowns the whole structure.

What is this steel island needed for?

Oil and gas fields on the continent, which can be mastered comparatively easily, are well known. Their operation goes on full blast. It is a more complicated matter when prospecting for and developing fields of mineral fuels in the shelf (shallow-water) zone of the sea. The traditional self-raising drilling platform can stand on soil only if the depth does not exceed 90 meters. And even in this case the elements make themselves felt.

However, even a strong hurricane is the least of the worries of the designers of offshore drilling platforms. The winds give birth to sea currents, driving enormous masses of water. True, their speed is only 3 percent of the speed of the wind, but then the density of the water is 800 times that of the air. And so the force of the impact of a wave on the steel framework of a drilling platform is 25 times as great.

Moreover, the storm is an uncontrolled force: the waves shake a structure with blows, the force and frequency of which are simply impossible to guess in advance, literally tearing it into sections. Foamy wave crests fly to heights of more than 10 m. And so, in this "infernal boiler," a drill rig should be able not only to stand up but also to operate reliably without an interruption of even an hour.

And when it is considered that exploration must be done at depths of about 200 m, then the traditional structures are entirely unsuitable. For the "feet" of the drilling platform have to be fabricated with such massive-ness that hauling and installing them is a supercomplicated task. The designers had to think out something basically new. And they coped with this task successfully.

"Shelf-1" is what the first domestic semisubmerged offshore drilling platform is called," says A. Noskov, deputy chief of the Drilling Section of the Ministry of Gas Industry. The idea of a float, half of which is submerged in the water with the top sticking above the surface, was suggested to the designers. In the transport position the platform rests on two floating pontoons and is towed to the region of exploration. At the required place, Shelf-1 is stopped and ballast (sea water) is pumped into the floats until the supports are submerged to a depth of 17 meters and the suspended platform hangs above the waves at a height of 13 meters. Strong anchor bracing wires reliably hold the steel island in place.

Today, no kind of storm is frightful to it. For, at the depth of the submerged pontoons, the water is calm, and at the surface the waves cannot harm the highly raised platform. Suppose a threatening storm warning is received. Then part of the ballast is pumped out of the tanks and the platform is raised to 17 meters above the water for greater safety.

Sensitive sensors keep watch on the draft of the floating drilling platform. For Shelf can receive cargo and fuel during operations, and that means that its weight changes. Moreover, the wind and waves can exert various influences. A balancing operator closely monitors the draft and list of the platform from a central control panel and, in case of necessity, levels it by means of the ballast tanks.

The basic task of Shelf-1 is exploration of underwater "storehouses," and, therefore, the chief thing on it is the drill rig, which was built by Uralmash specialists. It allows holes to be drilled to 6,000 meters. A whole complex for preparing for drilling work and for cementing holes was specified. The explorers have at their disposal a modern well-logging facility. It "feels out" formations below by means of waves of explosions, electrical impulses and gamma rays.

And if, finally, a valuable stratum is found, then flow, pressure and temperature--in brief, all the biographical particulars--can be measured directly on board. Chemists analyze the oil or gas in a special laboratory.

The floating island is a complicated engineering structure: on it is a multitiered deck and in the holds are the masses of equipment that provide for normal operation and everyday living for the whole crew. Elevators in the two middle supports move servicing personnel to the pump stations and fuel tanks. Fuel runs along pipes from here to the diesel generators that supply electricity for the whole complex. A spacious platform has been built on the upper deck for Mi-8 helicopter landings. A whole arsenal of divers' equipment is called for, for purposes of operation and repair. Three on-board cranes easily cope with all loading and unloading.

Nor did the designers forget about comfort for the crew of 100 persons-- comfortable 1-place and 2-place cabins, a dining room, a club and a whole complex of personal services are at their disposal. In brief, everything has been done to make them feel at home on the installation.

Shelf-1's reliability and strength provoke no doubts. But the elements are the elements. And so, in accordance with sea-registry laws, the floating drilling platform also has a whole set of rescue equipment. Here are both individual equipment and multiplace tanker-type lifeboats, to which even flaming oil is no stranger.

Today, Shelf-1 still stands at a dock of the Astrakhan Shipbuilding Association. The last work on it is being completed. But very soon the floating drilling platform will go out to the open sea and will go into operation for the explorers of underwater formations.

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## FUELS

### GAS INDUSTRY IN UZBEK SSR

Moscow GAZOVAYA PROMYSHLENNOST' in Russian No 4, Apr 80 pp 10-11

[Article by Alikhan Rakhmatovich Atadzhanov, manager of the "Soyuzuzbekgazprom" Association: "Introduce Efficient Comprehensive Program"]

[Text] In the February issue of this magazine (No. 2, 1980) an article by S. A. Orudzhev reported on the strained situation at the "Soyuzuzbekgazprom" Association with respect to fulfilling the plan on gas extraction and the necessity of taking urgent steps to overcome the existing difficulties and shortcomings. Below we publish the reply of Alikhan Rakhmatovich Atadzhanov, manager of this association, from which the reader will learn of the ways and means selected by the association's collective to insure the absolute fulfillment of the government tasks for the final year of the five-year plan period.

The gas industry of the Uzbek SSR entered a qualitatively new, more complex stage of development characterized by the natural depletion of gas reserves in the Gazliyskaya group of deposits and the shift of the raw materials base to new regions with complex geological conditions -- abnormally high strata pressures and the presence in the gas of corrosive components: hydrogen sulfide, carbon dioxide, etc.

In this connection, the main strategic problems of the association for the near future are:

a considerable increase in the production of hydrogen sulfide containing gas in new gas-producing regions with its complete subsequent reprocessing;



a reduction in the rate of the falling-off of gas production in old gas-producing regions -- the Gazliyskiy and Mubarekskiy -- by implementing a broad complex of geological-technical and organizational measures.

The operation of our association in regions with abnormally high strata pressures requires a qualitatively different, more complex and efficient system of drilling.

The existing structure of drilling organization, the production relationships between its subdivisions and the technology used do not fully provide the normal course of well-building in such complex deposits, as Zevarda, Shurtan, Dengizkul'-Khauzak, Kultak and Pamuk. Moving the Gazliyskiy UBR Drilling Work Administration closer to promising locations, organizing reliable communications between all wells being drilled and assimilated, creating a modern base for production servicing, which includes complete preparation of drilling, working and casing pipes, repair, procurement and installation of blow-out-prevention equipment, repair of turbine drills -- these are paramount organizational problems facing the drilling service.

Special attention must also be given to increasing commercial and cyclic drilling speeds, improving the quality of technological and technical designs, improving the structures of gas wells and the formulas of scrubbing liquid, efficient finishing off of drill bits and their quality control, and improving the technology of reinforcing gas wells.

It is planned to concentrate further the necessary material-technical and manpower resources in the region of the Muberskaya and Shurtanskaya group of deposits, which will make possible, by building up the new gas-condensate deposits of Zevarda, Blan, Pamuk, Dengizkul'-Khauzak and Shurtan an increase in the capacities for producing gas in 1980 to sixteen billion  $m^3$ . For this, it is necessary to drill 100,000 to 105,000m deep wells in these fields.

The general problem of association drillers in the current year, when the ratio of drilling in deposits with abnormally high strata pressures has practically stabilized at a level of 50 to 55% of the total drilling, is to develop and begin to implement systematically a comprehensive organizational-technical program of constant increase in technical-economic indicators.

One important problem in balancing the development of the gas industry of Uzbekistan is the utilization of gas and condensate. For this purpose, the Mubarekskiy Gas Reprocessing Plant is being modernized. Its first stage reprocesses six billion  $m^3$  of hydrogen sulfide containing gas and produces 160,000 tons of sulfur per year.

The basic practical measures for the stable operation of the plant, to be implemented this year, are the installation of additional air refrigerators and pumps, as well as the replacement of purified gas separators and water cooler-condensers by air. These measures will make it possible to reduce losses of ethanol amine to the rated norm and provide for the quality of the commercial gas to meet the industrial standard.

In the very near future, the rated capacity of the Mubarekskiy Gas Reprocessing Plant will be increased to fifteen billion  $m^3$  per year and the production of sulfur -- to 470,000-500,000 tons per year by putting new technological units in operation.

At present, work is being done on reaching the rated capacity in 1980 of the installation for gas purification at the Uchkir' deposit with a capacity of 0.9 billion  $m^3$  per year. Afterward, a more powerful installation will be built at Shurtan. In the near future, it is planned to erect a new gas processing complex to purify high sulfur containing gas from the Kandym and Saman-Tepe deposits with separation of commercial sulfur.

To increase gas production at the Gazli deposit, the Soyuzuzbekgazprom plans, the following in 1980: organization of the delivery of gas for its own needs to DKS-1 and DKS-2 [Separator pump unit], the utilization of a number of piezometric and observation wells as operational wells, the driving of an independent loop from several wells, operating on an "alien loop," blowing through loops of levels XII and XIII of low yield wells gas from the IX and X levels, installing a system for cooling the cyclic air at the DKS-2, etc.

The implementation of these measures will provide for obtaining an additional 320 million  $m^3$  of sulfurless gas per year.

It is planned to implement strata purification of gas from hydrogen sulfide at the Mubarekskaya group of deposits. For this purpose, the low sulfur content gas from the Panuk and Kultak deposits will be pumped into the depleted gas beds of the XII and XIII levels of the Southern Mubarek deposit. Experimental pumping of low sulfur content gas into the beds of the XII and XIII levels was already begun in December 1979.

Close cooperation with scientific research and design organizations helped the association's collective in the implementation of the planned measures. The association established a goal -- to fulfill governments tasks on producing gas by 25 December 1980.

An especially responsible stage in the activity of the association is preparing to meet the 110<sup>th</sup> anniversary of V. I. Lenin's birthday.

The collective "Soyuzuzbekgazprom" All-Union Production Association, guided by the November (1979) decree of the Plenum of the CPSU Central Committee, using widely advanced experience and increasing the efficiency of its work is successfully fulfilling the obligations assumed in honor of the famous event, fulfill the plan for the final year of the Tenth Five-Year Plan.

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# EXPERIMENTAL INDUSTRIAL OPERATION OF GPU WITH MARINE ENGINES

Moscow GAZOVAYA PROMYSHLENNOST' in Russian No 4, Apr 80 pp 15-17

[Article by A. I. Yakovlev (Ministry of the Gas Industry)]

[Text] In the process of the experimental-industrial operation of the GPU [Gas-pumping installation] with marine engines, developers, manufacturers and operating workers jointly investigated thoroughly the operation of units and parts of machines, prepared and carried out measures to improve their design and increase their reliability. The wide introduction of GPU with marine engines are recommended in the gas industry.

Machine builders did a great amount of creative work on developing new gas-pumping equipment. In 1977, they manufactured three prototypes of GPU-10 gas-pumping installations with a gas-turbine 10,000 kw marine engines.

These unit plants are intended for installation on the ground level in machinery halls or individual enclosures of the light-duty type. The turbine-compression part of the unit can also be installed in a container without cover.

The GPU consists of a gas-turbine engine of the marine type on a common frame with all units, systems, oil tank and complementing equipment necessary for its operation and partially for the operation of the pump; a type 370-18-1 pump unit with protective devices; a "Kompas-2" automatic control and protection system; units for air intake and exhaust with noise-suppression systems; and a container with fire-fighting, gas-detection, lighting and air ejection systems.

The arrangement of the GPU-10 gas-pumping installation (without air intake and exhaust devices and without the container) is shown in Fig. 1.

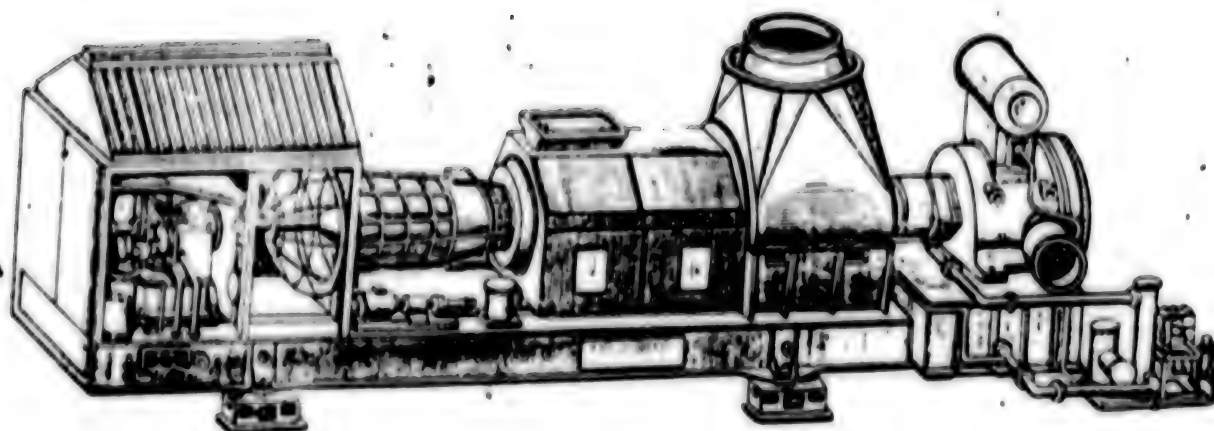


Fig. 1. GPU-10 gas-pumping installation.

The basic operating features of the GPU-10 are: constant nominal power (10,000kw) at an ambient temperature of 25°C and lower maintained by temperature regulating apparatus; independence from an external electrical power supply to the KS [Compressor station] due to the pump being driven by the engine shaft and the installation of the oil system radiator in the suction shaft of the engine. When the electric power supply is interrupted, the control system operates from a storage battery.

In spite of the high level of losses in the suction channel and in the exhaust, the efficiency of the gas-turbine installation at the shaft of the power turbine is not less than 26.6%.

The gas-generator part of the engine is made with a two-stage compressor, with each stage having a drive-turbine high pressure and turbine low pressure (TVD and TND). The pump drive is a power turbine tied gas-dynamically to a gas-generator.

The engines are not repaired under compressor station conditions. Their service life until capital repairs was determined to be 20,000 hours (with subsequent extension).

To check the technical-economic and operating indicators of the GPU-10 under actual conditions, it was decided to build an experimental industrial compressor station with these installations at Torzhok. Such an advance check of the equipment made it possible to implement in 1978-1979, the production of new industrial lots of these machines without waiting for results of interdepartmental tests, which were

planned at the loading gas loop in the Ochakovo region being built at that time.

This decision justified itself fully. Three GPU-10 installations were put in operation at the compressor station at Torzhok in 1978. Even before the start of the interdepartmental tests, it became clear that along with the necessity of further improvement of the assembly design, it may be recommended for wide introduction in the gas industry.

The advance operating experience of the three GPU-10 installations deflated the opinion of some that these new machines did not need to be checked because they were made on the basis of a well-developed and reliable marine gas-turbine engine and pump. Nevertheless, the check was necessary inasmuch as the process of design of the machine, only the turbocompressor part of the engine remained without change, while all the other equipment was redesigned extensively. Thus, a new system of fuel regulating apparatus, working on gas, was created and the oil cooling system was redesigned. Instead of direct cooling of oil in "sea water-oil" heat exchangers, an air cooling system was used with an intermediate "air-water (antifreeze) -- oil" loop. Radiators of the diesel engine type were used in the system. They were mounted in the suction channel of the machine and the water was cooled (antifreeze) by the cyclic air. Water (antifreeze) pumps are driven from the engine shaft. The system was checked only on test stands.

A special box with gear drives was designed for the main oil and compacting pumps, antifreeze pumps, oil centrifuges, the turbine expansion engine and starting devices. The box is mounted ahead of the engine intake (on the oil tank) and is connected to the engine by an intermediate shaft. The VNIPASUtransgaz developed a "Kompas" type system for the control, monitoring and protection of the unit.

A number of new design solutions were adopted on coupling the engine with the pump, the positioning of the starting oil and compacting pumps, the arrangement of the pump protective device unit; the design of the power turbine was changed partially; the design of the bearing unit of the internal shaft of the engine was improved, etc.

The commission organized for making the 72-hour acceptance tests and transferring the installations to experimental-industrial operation completed its work in December 1978. It outlined measures for improving the design of the machines, including improving the convenience of their servicing, increasing the reliability of their operation and carrying out preventive maintenance.



A number of shortcomings came to light during the GPU-10 receiving tests: breakage of engine shaft clutch, faults in the fuel feed regulating system, cracks in the fuel gas filters installed at the input of the fuel regulating system, breakage of shafts and gears in the gear box, failure of the turbine expansion engine due to breakage of bearings, fracture of radiator sections and falling off of tube ribbing.

Also observed were the falling of the oil pressure in the regulation system and the pump oil supply system and unstable operation of the rotation regulator in the fuel regulating apparatus system. Additional finishing off work was required on the design of throttle valve which did not always provide for smooth acceleration and deceleration of rotation, and the centrifugal rotation sensors did not operate reliably enough. In the control system, the device for measuring the rotation speeds of the power turbine and high pressure compressor did not operate reliably. Nor did the devices for protection against excessive temperature beyond the high pressure turbine and extinguishing the jet operate reliably enough.

An essential shortcoming was detected, such as rapid "aging" of the oil engine. The cause of this phenomenon must be studied and eliminated.

At the first stage of the experimental-industrial operation, the bearing unit of the internal shaft did not operate reliably enough. The bearing failed after 1203 hours on one unit and 3198 hours -- on another unit. Corresponding measures were taken to eliminate this defect and no more such cases were observed.

The active participation of developers and manufacturers in the process of the experimental-industrial operation should be noted as a positive fact. They investigated all failures thoroughly and took efficient measures to eliminate them. Due to such coordinated work, the basic shortcomings of the machines were recognized, investigated and eliminated.

It is characteristic that during the experimental-industrial operation period, with selected arrangement (two operating plus one standby units) the compressor station stopped only once and then for only a short time.

On 1 January 1980, the running time of the units amounted to 6300 hours per unit on the average. Practically all the running time was maintained at a power (physical) of 10,000kw assigned in accordance with the engine characteristic.

An analysis of emergency stops indicated that almost half were false (due to unsatisfactory operation of individual devices). The time spent on eliminating the faults was fairly high. However, under conditions of

experimental-industrial operation, when the units actually were being finished-off, this is not significant. The average running time in the second half of 1979 reached 700 hours (of the "leader" unit -- 885 hours).

At present, all units are released for operation are fully corrected (taking into account the operating experience), while the previously manufactured units will be corrected before they are put in operation at industrial compressor stations. One such new unit was tested by the Interdepartmental Commission at a test stand with a gas loop in the Ochakov region.

The tests were made at 12,000kw (20% higher than nominal) with a great number of hot and cold starts, emergency and normal stops, i.e., under so-called "heavy" modes. The start-ups were only automatic. The total running time in the tests was 250 hours (124 start-ups, 42 cold blow-outs and 49 artificial emergency stops). Test results indicate the efficiency of the measures introduced to increase the reliability of the units and improve their servicing.

Thus, to increase operating reliability and convenience in servicing the units, the number of some oil filters was doubled making it possible to clean or change them without stopping the machine; the drainage system was improved, the fuel apparatus was moved to a place more convenient for regulating its components; preheating of the oil tanks of the engine and pump was introduced; the length of the spring between the shafts of the power turbine and pump was increased (to improve access to the bearing cover of the pump during repair) and other technical solutions were introduced.

The Interdepartmental Commission also outlines a number of measures for further improving the design of the GPU-10 installations and recommended their use at an industrial compressor station of up to 20,000 hours of running time being built at Novopskov under the supervision and technical guidance of developers and manufacturers.

Much remains to be done to improve GPU-10 installations. We expect the designers and machine builders to give us machine prototypes with two-stage full pressure pumps, as well as air-cleaning devices equipped with modern components with deicer systems and highly efficient systems for preparing the fuel and start-up gas.

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## OPERATING EXPERIENCE OF GAS PUMPING UNITS USING AIRCRAFT DRIVE

Moscow GAZOVAYA PROMYSHLENNOST' in Russian No 4, Apr 80 pp 21-23

[Article by V. N. Luzyanin, Yu. P. Komlyk, Ye. A. Ostapov, A. M. Khoroshchenko, Gor'kiy Transgaz, Sumskiy Affiliate of SKB [Special design bureau] TkhM [Turbo-cooling machine]]

[Text] In a comparatively short period, the assimilation of the GPA Gas pumping unit with an aircraft drive at the Gor'kiytransgaz KS [Compressor station] reached a high level of reliability. This was facilitated to a considerable extent by the improvement of methods of servicing the units, proper organization of labor and the use of efficient forms of socialist competition.

The delivery of the first GPA with aircraft drives -- the GPA-Ts-6, 2, to gas pipelines in the country began in 1973. At present, 45 compressor stations are equipped with these units, of which 29 are operating.

The largest user of such drives is the "Gorkiytransgaz" Association which operates the Nizhnyaya Tura-Perm'-Gor'kiy-Tsentr main gasline. All eleven KS of the gas pipeline are equipped with GPA-Ts-6, 3 units. Of the total running time of GPA with aircraft drives for the Mingazprom [Ministry of Gas Industry] amounting to about 2.2 million hours (as of 1 January 1980), over 1.2 million hours are due to units operated at Gor'kiytransgaz KS.

As indicated by the data on the operation of KS equipped with GPA with aircraft drives, operating indicators of these units, especially reliability indicators (running time to failure, service life between repairs, readiness coefficient, etc.) vary strongly in various gas pipelines, as well as at KS (within one association). Apparently, this may be due to the uneven efficiency of refining the GPA, as well as various levels of their operation at individual KS.

An analysis, correlation and wide dissemination of the experience of refining and operating GPA with an aircraft drive, obtained at advanced KS equipped with such units becomes of special importance in this connection.

Gorkiytransgaz enterprises have accumulated a great deal of positive experience in operating and refining GPA-Ts-6, 3 units working in close cooperation with design organizations and manufacturing plants. As a result, the association was able to achieve operating indicators for GPA with an aircraft drive which not only exceed considerably the average indicators for these units for the Mingasprom, but do not take second place to and frequently exceed similar indicators for GPS with an industrial gas-turbine drive which had an incomparably greater period of industrial assimilation.

The Table shows the reliability indicators of the GPA-Ts-6, 3 units for 1976-1979 (first half year at two leading KS of the association) (Shemordanskaya and Permskaya) compared to the average values of these indicators for the Mingasprom and Gorkiytransgaz (according to data by the Orgenergogaz). Units at the indicated KS are installed from an experimental-industrial lot, as well as from series manufactured, ones which made it possible to judge the efficiency of refining the experimental-industrial machines according to the dynamics of their indicators.

It follows from the data of the Table that: the average running time of units until failure at advanced KS exceeds by four to seven times these indicators for GPA with an aircraft engine for the Mingasprom, while the readiness coefficient is higher on the average by four percent. Also very characteristic is the rapid increase in the average running time till failure from the start of unit operation: by 35 times at the Shemordanskaya KS to 56 times at the Permskaya KS, while the average running time to the failure of GPA units with aircraft drives for the Mingasprom during this period increased only by six times. True, the initial indicator (68 hours) at the Shemordanskaya KS was very low due to the adjustment of the KIP [Monitoring-measuring devices] and A [expansion unknown] during the start-up and tune-up work and tests, as well as the lack of experienced personnel during this period. Special attention is drawn to the fact that the high level of reliability was achieved under conditions of the large general running times of units (over 25,000 hours by individual GPA) which confirms the high quality of the basic design solutions of the GPA-Ts-6, 3 unit.

Also significant is the sharp reduction (15 to 20 times) in unit failures since the start of operation. This indicates the efficiency of the measures on the refining of the GPA-Ts-Ts-6, 3, the high-grade and timely operational work, as well as by the very skillful operational personnel.

Table

Year	work	Relative time, % stand- by	preventive maintenance	forced stops	Ave. running time per one forced stop, Kg hours	Coefficient of readiness, Kg
For Shemordanskaya KS						
1976	75.5	6.1	5.7	12.7	249	0.856
1977	71.3	19.2	5.1	4.4	960	0.942
1978	79.6	15.9	4.1	0.4	8720	0.995
1979	80.2	16.2	2.6	1.0	8762	0.988
For Permskaya KS						
1976	56.7	24.8	3.3	15.2	68	0.789
1977	68.9	27.0	3.0	1.1	2226	0.984
1978	68.8	27.5	5.3	0.4	4522	0.994
1979	66.9	26.4	2.8	3.9	25.04	0.945
For Gorkiytransgaz						
1976	45.0	39.3	4.1	11.6	166	0.790
1977	66.3	25.9	4.9	2.9	825	0.958
1978	66.2	26.2	5.3	2.3	1595	0.966
1979	64.1	27.2	4.6	4.1	1684	0.939
For Mingazprom						
1976	58.6	18.9	4.7	17.8	156	0.770
1977	60.6	29.4	6.4	3.6	676	0.943
1978	58.3	32.5	6.1	3.1	1056	0.950
1979	55.8	35.6	5.5	3.1	1140	0.947

Note. Start of operation of units at the Mingazprom and the Gor'kiy-transgaz are September and December 1974 respectively. While at the Shemordanskaya and Permskaya KS -- January and October 1976 respectively.

At the Gorkiytransgaz, a great deal of attention is given to providing high operational GPA indicators. Proposals of developers on refining the units are introduced opportunely and fully. KS workers participate actively in improving the units and systems. Their attention is centered on providing a high level of machine servicing, proper organization of labor and the utilization of efficient forms of socialist competition.

The high level of machine servicing at advanced KS is provided by increasing the skill of the workers in the process of technical studies and individual training, as well as by improving the organizational forms of servicing on the basis of providing teamwork in all services at the station.

In particular, there is such a form of servicing as a "Chart of Labor organization with movement routes for shift personnel." In this case, all KS equipment is inspected and a list of all detected malfunctions is prepared. Possibilities for eliminating the faults without stopping the KS are determined or they are included in the volume of regular operational work.

Another form of maintaining GPA efficiency is carrying out training exercises on eliminating machine malfunctions. Under complex working conditions (low ambient temperatures, high KS loads, etc.) additional attendants and emergency brigades are used. The pump and general station systems are repaired without using outside specialists.

At the Shemordanskaya KS, the basic and auxiliary equipment is assigned to the workers of the respective services by organizing brigades consisting of a shift engineer, shift mechanics, a repair mechanic and KIP and A instrument operators. They carry the full responsibility for the technical condition of the equipment.

To reduce the performance time of operational work, detailed instructions are prepared for special kinds of work; measurement devices and installations are checked preliminarily; standby components for the automatic control system and actuators that have passed receiving inspection etc. are prepared.

The GPA-Ts-6, 3 unit was modernized by its designers on the basis of operating experience. The modernized GPA-Ts-6, 3/56M unit, which was awarded the government emblem of quality, includes a number of design improvements. The most important of them are: expansion of the turbo unit container, the use of metal foundation frame for the unit and a welded submotor frame for the engine, a change in the design of the exhaust system; an increase in the capacity of the oil tank; an improvement in the automatic control system, etc.

In conclusion, it must be stated that on the basis of the GOA-Ts-6, 3 machine, the creation of a more powerful and efficient GPA-Ts-10 machine with a modified NK-12St engine, in which possibilities of its aircraft prototype (power reserve to ten megawatt and efficiency up 28%) were more fully utilized, would have a great economic effect on the gas industry. The use at compressor stations of the GPA-Ts-10 machine, standardized to a maximum extent on the basis of the refined production and operation

and fairly widely use of the GPA-Ts-6, 3 machine, would make it possible to reduce capital and operational costs considerably due to a reduction in the number of machines at the stations and a reduction in the consumption of gas transported for the needs of the compressor stations.

The positive experience of close cooperation between gas workers and machine builders, strengthened by many years of work on creating and assimilating the GPA-Ts-6,3 makes it possible to hope that in the very near future, the gas workers will receive new, highly efficient gas pumping machines with aircraft drives.

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## FUELS

### BIRTHDAY ANNIVERSARY OF YE. K. BAYBAKOVA

Moscow GAZOVAYA PROMYSHLENNOST' in Russian No 4, Apr 80 p 40

[Editorial: "Glorious Labor Path"]

[Text] Yevgeniya Konstantinovna Baybakova, one of the oldest workers in the gas industry becomes 70 years old.

Ye. K. Baybakova has been working for over forty years in the petroleum and gas industry system. After completing the Azerbaydzhani State University imeni Kirov, she trod the working path from labor economist in the "Leninft" Trust of the "Azneft" Association to be Chief of the Labor Planning and Wages Department of the Economic Planning Administration of the Ministry of the Gas Industry, a position she has held for over ten years.

Ye. K. Baybakova has broad erudition, is extremely industrious, has high principles and imposes great demands on herself and her subordinates. Yevgeniya Konstantinovna shares her extensive all-around knowledge generously with young people and all her working comrades. A highly skilled economist, who learned the entire production activity of the Ministry of the Gas Industry extensively, she is an excellent organizer.

In the period of the formation of the Ministry of the Gas Industry, Ye. K. Baybakova contributed greatly in organizing the economic service in the central apparatus, as well as in departmental enterprises and organizations. She does a great amount of everyday work on improving the planning of labor and increasing labor productivity indicators at industrial enterprises, in gas transport, in deep drilling and construction.

Yevgeniya Konstantinova is always at the center of the social life of the ministry and has merited the respect of the multithousand collective of gas workers.





Ye. K. Baybakova was awarded the "Emblem of Honor" order and seven medals for many years of faultless work. Her work was marked many times by departmental awards. In 1975, she was awarded the title of "Honorable Worker of the Gas Industry."

The editorial board and the editor of the "GAZOVAYA PROMYSHLENNOST'" journal warmly congratulate Yevgeniya Konstantinovna Baybakova on this glorious anniversary and wish her happiness and further successes in her fruitful labor activity.

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## BRIEFS

**GAS-SERVICE INSTALLING LAGS--**Olishevka Settlement, Chernigovskaya Oblast. Four years ago a line was laid to our settlement from the trunk gas pipeline that passes nearby. All the required equipment and high-pressure pipe were brought in. Four gas distribution boxes were set up near a school, a hospital, an ambulance station and a bakery. The design for converting the settlement and kolkhoz, social, domestic-services and cultural facilities to the use of gas was made some 6-7 years ago on order of the kolkhoz agent Agrov. Since then talk about gas has continued, but not as joyfully. The ceilings on converting the settlement to gas have not been released to us, and this facility is not mentioned in the construction plan. Our efforts have not been crowned with success. As before, the settlement's upkeep activity expends thousands of tons of coal, briquettes and liquid fuel for heating, and still there is a severe shortage. But meanwhile the idle gas equipment is slowly deteriorating, and the pipe, which is in short supply, rusts. A lot of money has been thrown to the wind. For indeed, sooner or later the time will come when the matter will be brought to a conclusion, and then new funds will be required for new pipe. [Text] [Moscow IZVESTIYA in Russian 12 Aug 80 p 2] 11409

**NOVOSIBIRSK GETS TYUMEN' GAS--**Novosibirsk. Casing-head gas has come to Novosibirsk from Tyumen' oilfields. Tapping of the Nizhnevartovsk-Kuzbass [Kuznetsk Coal Basin] trunk pipeline has enabled enterprises of the large Siberian industrial center to convert to gas. The Novosibirskgorgaz [Novosibirsk City Gas Administration] controller lifted the telephone and reported the city's readiness to receive gas to the operator of the gas distribution complex. The latter, making the necessary notes in his duty log, turned a handwheel, opening a slide valve. Gas flowed into the city's arteries. The flow of gas to still another city of the country was put under monitoring by the Central Control Administration of the USSR Unified Gas Supply System. "This is for us an important and festive occasion," says Novosibirskgorgaz chief N. Grigor'yev. "The major construction has been completed: specialists of Omsknefteprovodstroy [Trust for Oil Pipeline Construction in Omskaya Oblast] have laid almost 150 km of pipeline. The builders coped honorably with the complicated work. A double inverted siphon was laid at the bottom of the Ob' for the gas pipeline. Five gas-distribution centers will function in Novosibirsk: the first is already in operation. About 100 km of the gas-distribution grid remains

to be built in the city yet. In 1981 more than 1 billion m<sup>3</sup> of Tyumen' gas will pass through it, in 1982 more than 2 billion. Striving to meet Novosibirsk's needs, Minneftegazstroy [Ministry of Construction of Petroleum and Gas Industry Enterprises] builders decided to lay this year additional tens of kilometers of city gas pipeline. [Text] [Moscow IZVESTIYA in Russian 29 Aug 80 p 2] 11409

COAL PIPELINE DESIGN--Donetsk. Donetsk specialists from the long-distance hydraulic transportation institute of UkrNIIGidrougol' [Ukrainian Scientific-Research and Design-Development Institute for Coal Mining by the Hydraulic Method] has begun research on the erection of the country's first industrial-test pipeline for transporting coal 250 km. It will be installed during the Eleventh Five-Year Plan under a preliminary design by VNIIGidrougol' [All-Union Scientific-Research and Design Development Institute for Coal Mining by the Hydraulic Method] (Novokuznetsk) and will link the Inskaya Underground Mine in the Kuzbass [Kuznetsk Coal Basin] with TETs-5 in Novosibirsk. It is proposed to create later a complete hydraulic-transport system for supplying Kuzbass fuel to electric-power stations of west Siberia and the Urals. Its total length will be 2,000 km, and 25 million tons of coal will be pumped along it per year. [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 16 Aug 80 p 2] 11409

COMPRESSED-AIR MINE ROOFS--Alma-Ata. Compressed air will be able to replace the roof supports used during underground coal mining. Tests of elastic inflated envelopes conducted by the Institute of Mining of the Kazakh SSR Academy of Sciences have confirmed this. They withstand a mine pressure of 60-80 tons per m<sup>2</sup>, and they react softly to any sagging of the roof. The inflated envelopes will cut metal consumption per running meter of excavation from 2-4 tons to 200-300 kg. Alma-Ata scientists have proposed a set of 20 types of elastic envelopes for supporting various types of excavations. This will enable wide use of the innovation at the underground mines of all our country's coal-mining basins. [Text] [Moscow TRUD in Russian 17 Aug 80 p 1] 11409

SEMI-SUBMERGED DRILLING PLATFORM--Astrakhan'. The use of high-capacity semisubmerged floating installations will become a new stage in the development of offshore oil and gas deposits. Erection of the first installation for sinking 6-km holes in the open sea is being completed at the Astrakhan' Shipbuilding Association. Each drilling platform of this type will be a huge structure. It will be self-contained in operation and able to withstand any storm: the platform will be installed on submerged floats and fastened to multiton anchors. Automated equipment will be charged with checking on the stability of the complex. The head enterprise was rebuilt in order to master launch of the Shelf-1 installation, said general director of the association V. Bezzhonov. A new department was built in which stands, units, and machines were joined in a single industrial line. A computer controlled progress of the work. Through advanced work methods, the association's collective reduced the period spent assembling the installation. In preparing to greet the 26th CPSU Congress worthily, the shipbuilders have committed themselves to sending Baku oil-field workers the first installation before the end of the year. [Text] [Moscow IZVESTIYA in Russian 8 Jul 80 p 1] 11409

**SIBERIAN PIPELINE COMPRESSOR STATION**--The first compressor station on the Nizhnevartovsk-Tomsk-Kuzbass [Kuznetsk Coal Basin] gas pipeline has gone into operation. With its introduction, the feed of fuel and valuable chemical raw materials to West Siberian industrial centers has been doubled. Casing-head gas from Samotlor's fields will be fed over the 1,300-km trunk pipeline. [Text] [Moscow IZVESTIYA in Russian 8 Jul 80 p 2] 11409

**COKING GAS FOR IRONMAKING**--Donetsk. The gas flares over the Avdeyevka By-product Coke Plant imeni 30-Letiya SSSR have been extinguished. The surplus fuel, which previously was flared off, will be used in blast-furnace production of the Makeyevka Metallurgical Plant imeni S. M. Kirov. A 30-km trunk pipeline that joins the two enterprises has gone into operation here. Thus Makeyevka metallurgists have taken one more important step in the full transition from natural gas to less expensive coking gas. With introduction of a second pipeline, the Makeyevka plant will dispense completely with the use of the blue fuel, enabling a reduction in its consumption by 400-450 million m<sup>3</sup> per year. [Text] [Kiev PRAVDA UKRAINY in Russian 21 Jun 80 p 2] 11409

**PIPELINE CLEANER-INSULATOR MADE**--Leningrad. The use of units that simultaneously clean and insulate pipe will speed up the laying of gas pipelines. The output of such combined machines has been mastered at a machine-building plant. Yesterday the first lot of the machines was sent to a construction site of the Ukhta-Gryazovets gas route. This is the part of the trunk line that will enable fuel from Tyumenskaya Oblast fields to be fed to the Central Economic Region. The Leningrad enterprise up till now has produced installations for the separate cleaning and insulation of pipes. The combining of these labor-intensive operations will double savings in the work force. The builders will also gain from a lengthening of the service life of the combined machine over that of the separate installations. The precise filling of orders from Siberia and the Far East is a plant tradition. Articles for this region are readied here according to a crash schedule. The collective is using reserves that were discovered during socialist competition. (TASS) [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 28 May 80 p 2] 11409

**POLYETHYLENE PIPE PRODUCER**--Kazan'. The petrochemical complex that has been established in Tataria in recent years has been augmented by a new enterprise: the country's largest plant for making polyethylene pipe has begun to operate in the Kazan' production association Organicheskiy sintez. Automatic equipment carries out all operations at the new enterprise. Its annual capacity is 50,000 tons of pipe 63-1,200 mm in diameter. Polymer materials made from casing-head gas are one-eighth the weight of steel. [Text] [Moscow TRUD in Russian 18 May 80 p 1] 11409

**SAMGORI-BATUMI OIL PIPELINE**--The line has been extended 253 km, from Suram Pass to Batumi, with 250 km already built. Line work is complete and the brigades have undertaken to eliminate technological gaps. The Vakhtangov brother welders achieved high work results. Under most inaccessible conditions they managed to bring in the pipe and weld joints of difficult geometric pattern. At the 963-m elevation above sea level, the collective of the

fourth section, which is supervised by V. Barbakadze, having turned over the main volume of linear work, is occupied in testing the oil pipeline. With startup of the Samgori-Batumi oil pipeline into operation, the delivery of raw materials to oil refiners will be greatly increased. [Text] [Moscow STROITEL'NAYA GAZETA in Russian 7 Sep 8 p 1] 11409

**SURGUT-POLOTSK OIL PIPELINE**--The construction of a transcontinental trunk pipeline is nearing completion. A section of the Surgut-Gor'kiy pipeline, which is more than 2,000 km long, is already in operation. Eighteen industrial flow-line groups of Ryazan', Kuybyshev, Voronezh and Bryansk pipeline construction trusts, Mosgazprovodstroy [Trust for Pipeline Construction in Moscow Oblast], and a welding and assembly trust are toiling on the Gor'kiy-Polotsk line. And here is the result: more than 850 km of pipeline have been welded. The first-priority task of the builders is to turn the Gor'kiy-Yaroslavl' segment over. Less than 20 km remain to be welded here. The collective of SMU-1 [Construction and Installing Administration No 1] of Ryazan'truboprovodstroy [Trust for the Construction of Pipelines in Ryazanskaya Oblast], under Ye. Barauley, has achieved high results. The main volume of welding has been completed in Kalininskaya Oblast, where the collective of section No 1 of SMU-1 of Lenzgaspetsstroy [Special Trust for the Construction of Gas Industry Enterprises in Leningrad Oblast] of Glavtruboprovodstroy [Main Administration for Oil and Gas Pipeline Construction] is operating. [Text] [Moscow STROITEL'NAYA GAZETA in Russian 7 Sep 80 p 1] 11409

**URENGOY-GRYAZOVETS GAS PIPELINE**--Minneftegazstroy [Ministry of Construction of Petroleum and Gas Industry Enterprises] builders are committed to completion of the linear portion of the complex next year, and 1,300 km have now been completed on the route. Having landed on the shore of the Sukhona River, V. Chikishchev's brigade from SMU-6 [Construction and Installing Administration No 6] of Uralsneftegazstroy [Trust for the Construction of Oil and Gas Industry Facilities in the Urals Economic Region] has undertaken the insulating and pipeline-laying work. The collective faces the task of finishing the laying and insulation of a 500-m section of the gas pipeline before freezing weather sets in. Thirty compressor stations, electric-power lines, substations and roads are to be erected on the route. [Text] [Moscow STROITEL'NAYA GAZETA in Russian 7 Sep 80 p 1] 11409

**OMSK PETROCHEMICALS PLANT**--Omsk. If enterprises filled out biographical questionnaires, then the Omsknefteorgsintez Association's would look something like this. Age: 25. Occupation: oil refining and petrochemistry. Government awards: Order of Labor Red Banner. The combine is producing a broad assortment of petroleum product: high-octane gasoline, regular and heavy diesel fuel, jet fuel, marine and firebox mazut, high-performance oils for automotive transport and industry, and catalysts. Batches of thermal gas-oil and the antiaging resins Omsk-1 and Omsk-7, which replace expensive imported materials, have been obtained here for the first time in the industry. Workers of the combined ELOU-AVT [electrical atmospheric-vacuum pipestill desalination installation], which is the largest at the plant and, perhaps, the largest in the industry, have



achieved a special success. Together with designers and builders, in a radical rebuilding of the installation, they have raised its refining capacity by at least one-fourth. Omsk's petrochemical workers have unanimously responded to the party's call to greet the 26th CPSU Congress in worthy fashion. They have adopted increased commitments: to realize hundreds of thousands of rubles' worth of output above the plan before the opening of the 26th CPSU Congress. To have one more product certified for the State Emblem of Quality. On the first day of work of the party congress, to be operating on energy resources that have been saved. [Text] [Moscow SOTIALISTICHESKAYA INDUSTRIYA in Russian 5 Sep 80 p 1] 11409

CASPIAN OFFSHORE PIPELINE--Baku. The largest oil pipeline in the Caspian Sea, which connects the Neftyanyye Kamni pile oilfield with the continent, reached the village of Zhiloy today. The laying of half of the 62-km route, which separates the offshore oilworkers' village from the continent, has been completed. The builders' collective managed to surmount serious difficulties associated with strong underwater currents and complicated relief of the bottom, which is cut up in the area of the route by deep-water troughs and rocky ridges. A high degree of mechanization of all operations was provided for by the floating pipeline-layer "Suleyman Vezirov." Pipe was welded aboard it into lengths, and these were examined with a special X-ray installation, which greatly speeded up the laying of the line on the bottom and enabled the work to be completed ahead of time. "The new petroleum artery is of great significance," said Hero of Socialist Labor chief of Kaspimorneftegazprom [Production Association for the Recovery of Oil and Gas in the Caspian Sea] K. Abbasov. "Next year, when the whole route will be turned over for operation, the whole flotilla of tankers that are hauling crude oil from the island oilfield to the mainland will be released." [Text] [Kiev RABOCHAYA GAZETA in Russian 5 Sep 80 p 1] 11409

OIL WELL REPAIR EQUIPMENT--Baku. New underground installations for overhauling wells have been produced by the collective of the Baku Machine-building Plant imeni Leytenant Shmidt. They exceeded by 1.5-fold the load capacity of the Bakinets type units previously used. This year the plant, which is sending its output to many oil regions of the country and abroad, is producing the first industrial lots of 13 new types of items. [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 18 Jul 80 p 2] 11410

GAS OVERPRICING CHARGED--The Ministry of Gas Industry reports that a check conducted by State Inspection for Prices has established violations in the approval of schedules for electrical and thermal energy by Nadymgazprom [Nadym Gas Industry Production Association] (see No 22 of EG [EKONOMICHESKAYA GAZETA]). The data of the check were discussed at an expanded session of the ministry's Commission for Prices with a summons of the Nadymgazprom management. Association director V. V. Strizhov pointed out the existing serious deficiencies in matters of observing price discipline. It was proposed to put the total of the excessive receipts into state budget income. Settlements are now being made with the customers in accordance with schedules confirmed by the ministry. (M. Golovtsov,



chief of the Mingazprom [Ministry of Gas Industry] Economic Planning Administration). [Text] [Moscow EKONOMICHESKAYA GAZETA in Russian No 29, Jul 80 p 8] 11409

NEW CASPIAN OILFIELD--Still another field is gaining strength, 10-12 km from the Neftyanyye Kamni offshore oilfield. The drill reached an oil stratum at a depth of 3,500 m. It has been named the Oilfield imeni 28 April'--in honor of the date of the establishment of Soviet power in Azerbaijan. [Text] [Moscow EKONOMICHESKAYA GAZETA in Russian No 29, 1980 p 2] 11409

SHATLYK GAS FIELD COMPLETION--Development of the Shatlyk gas field has been completed ahead of schedule. Now, more than 100 million m<sup>3</sup> of natural gas will enter the Central Asia-Central Economic Region trunk gas pipeline each year from the field. [Text] [Moscow EKONOMICHESKAYA GAZETA No 29, 1980 p 2] 11409

GAS FOR SOUTH KIRGIZIA--The Andizhan-Mayli-Say gas pipeline, which is going into operation ahead of time, will enable the requirements of South Kirgizia enterprises for inexpensive fuel to be completely satisfied. [Text] [Moscow EKONOMICHESKAYA GAZETA in Russian No 29, 1980 p 2] 11409

UKRAINE'S LARGEST ANTIEROSION SYSTEM--Erection of the first phase of the Poles'ye antierosion system, the largest in the Ukraine, has been completed. It was created in Ovruchskiy Rayon of Zhitomirskaya Oblast. [Text] [Moscow EKONOMICHESKAYA GAZETA in Russian No 29, 1980 p 2] 11409

COAL MINE CABLE REPAIR--Voroshilovgrad. The first domestic explosion-proof vulcanizers for repairing flexible cable, which is used widely in the coal industry, have been developed in the Kommunar Mining and Metallurgical Institute. In a number of basic parameters they greatly surpass foreign counterpart apparatus. Previously, even when damage was slight, the cable had to be raised and repaired at the surface of the mine. Now the cable can be repaired directly in the underground excavations. Use of the vulcanizers at UkSSR Ministry of Coal Industry mines alone will save 480,000 rubles per year. The institute has also developed an industrial line for the centralized repair of flexible cable. Its productivity is 60-80 km of cable per year. [Text] [Kiev PRAVDA UKRAINY in Russian 13 May 80 p 2] 11409

BALTIC GASOLINE REFINING--Klaypeda. The main industrial installation for producing high-octane gasoline at the giant Baltic-Mazheykyay Oil Refinery, which is under construction, has been turned over for operation. This step completed erection of the enterprise's first phase. The operators are successfully mastering the new production, in order to prepare a worthy greeting for the 26th CPSU Congress. Industrial complexes whose final products will be sulfur and asphalt are being readied for startup. [Text] [Moscow IZVESTIYA in Russian 20 Aug p 3] 11409

URENGOY-NOVOPSKOV PIPELINE COMPRESSOR--Chelyabinsk. The first two units of still another high-powered compressor station--the Dolgoderevskaya,

on the Urengoy-Chelyabinsk-Petrovsk-Novopskov gas pipeline system--has been put into operation ahead of time. Together with the previously constructed Maskovo station, the new facility will increase the daily delivery of gas to the trunk pipeline by 10-11 million m<sup>3</sup>. "The builders and installers of our administration, as well as subcontracting organization workers," says SU-1 [Construction Administration No 1] chief A. Karamanov of Uralneftegazstroy [Trust for the Construction of Oil and Gas Industry Enterprises in the Urals], "have resolved to introduce three more units of the first phase into operation before the end of the quarter. Additional socialist commitments to complete work ahead of schedule have been adopted in honor of the 26th party congress. Speedy introduction into operation of the first turbine units is a good omen for this. The work volume that was set for the first half of the year had been overfulfilled by the end of May." The turbines of the two units that are operating on the trunk line are humming smoothly. The switching operations of the units and the monitoring--all these are controlled from a control panel by one person. And the builders continue to toil near the units. Workers of SU-2 of Gazmontazhavtomatika [Trust for the Installation of Automation for Gas Industry Equipment] are completing installation of the monitoring and measuring instruments and the automation equipment. Gas welders A. Abdulvalleyev and B. Vagretdinov and mechanics F. Sultanov, A. Minigareyev, R. Rashitov and P. Alekseyev are leaders in the socialist competition for shockwork performed during the precongress drive. [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 30 Jul 80 p 2] 11409

UNDERGROUND OIL STRATUM HEATING--Baku. It is known that heating an oil stratum raises its yield. But how to place high-powered heating installations into the earth's depths? The staff workers of the Azerbaijan Scientific-Research and Design Institute for the Oil Industry proposed an electrical steam generator which they designed as a singular furnace for wells. The innovation from Baku will help greatly to reduce periods for developing fields. [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 30 Jul 80 p 2] 11409

NEFTEYUGANSK DRILLING SURPASSES PLAN--Nefteyugansk drillers have achieved a high result: they have passed through 1 million meters of rock at the oil fields since the start of the concluding year of the five-year plan. They reached this goal almost a month ahead of the planned date. [Text] [Moscow EKONOMICHESKAYA GAZETA in Russian No 31, Jul 80 p 3] 11409

PAVLOVSKOYE FIELD FINDS GAS--Saratov. A powerful gas gusher was struck during drilling of an exploratory well at the Pavlovskoye field, which is situated in the east of Saratovskaya Oblast. G. Antonov's brigade from the Dergachev Oil Exploration Party obtained it. "This field," said A. Mordovin, chief geologist of the Lower Volga Regional Geological Administration, "we discovered last year. And now the first exploratory wells are confirming the great promise of the new field. We are still drilling the first story of the field. The gas deposits were found at a depth of 1,550 meters. This will facilitate its industrial recovery. But here is what is remarkable: 3 so-called stories have been observed for the deposits, which, according to our forecasts, will contain not only gas but

also oil. The lowest of them is found at a depth of 4,000 meters." Industrial operation of the Pavlovskoye field will enable the eastern Volga regions to be supplied with inexpensive fuel and to dispense with transporting it from the center of the country. [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 3 Sep 80 p 1] 11409

SURGUT-POLOTSK PIPELINE PROGRESS--Al'met'yevsk, Tatar ASSR. Liquid fuel from West Siberia has arrived at the Perm' transfer pumping station on the Surgut-Polotsk oil pipeline far ahead of the builders' deadline. The experience of the advanced brigades of Vostokmontazhgaz [Trust for the Installation of Gas Industry Installations in the Eastern Economic Region] in the erection of the Perm' oil-transfer pumping station has stimulated great interest. Specialists of the Ministry of Construction of Petroleum and Gas Industry Enterprises and USSR Gosplan are now studying the organization of work by the flow-line method, using the duty rotation technique. Today Vostokmontazhgaz installers have gone on a labor drive in honor of the forthcoming 26th CPSU Congress and, without reducing the pace, are toiling on the erection of new transfer pumping stations--the Debessinskaya and the Lazarevskaya. [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 12 Sep 80 p 1] 11409

KUZBASS-NOVOSIBIRSK COAL PIPELINE--Donetsk. Scientists of the Donetsk Section of the long-distance hydraulic transport institute of UkrNIIGidrougol' [Ukrainian Scientific-Research and Design-Development Institute for Coal Mining by the Hydraulic Method] are studying the construction of the country's first industrial-test pipeline for transporting coal over a distance of 250 km. Construction of this pipeline will start in 1982 from the hydraulic underground mine Inskaya (Kuznetsk Coal Basin) to Novosibirsk's thermal electric-power station. Many institutes, plants and organizations of the country are participating in the solution of this most important problem. According to the calculations of scientists, this will be the cheapest way to deliver the fuel. [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 12 Sep 80 p 2] 11409

BAKU REFINERY BEING REBUILT--Azerbaijan SSR. Multimeter-high columns have been thrown up at the Baku Oil Refinery imeni 22d s'yezd KPSS. This is a section that is being erected here under a program for radical rebuilding of the republic's refining industry with a high-capacity industrial installation for the primary refining of crude. The installation will produce a high-quality product that is needed for manufacturing lubricating oils. [Text] [Moscow STROITEL'NAYA GAZETA in Russian 20 Aug 80 p 3] 11409

NOVOSIBIRSK CONVERTING TO GAS--Novosibirsk, 26 Aug. A gas flare blazed up in Zayel'tsovskiy Rayon of the city of Novosibirsk. The blue fuel of Tyumen' storehouses had arrived at Siberia's largest industrial center, over a thousand-kilometer long pipeline. This event opens up a new page in the use of the natural riches of the eastern regions. Until now the main customers for Tyumen' gas had been enterprises of the Urals and the European part of the country. With arrival of the gas in the Kuznetsk Coal Basin, Novosibirsk's production effectiveness will grow and working conditions will be improved at many plants of Siberia's industrial south. The

conversion of Novosibirsk's boilers and TETs's to gas will reduce 8.5-fold the discharge of ash, soot and other impurities into the air. The builders have started to convert the first industrial facilities to gas. [Text] [Moscow PRAVDA in Russian 27 Aug 80 p 2] 11409

BASHKIRIA OILFIELD PROGRESS--Ufa. Bashkiria's oilfield workers have answered with new labor successes the sincere greeting of Comrade L. I. Brezhnev in connection with the recovery of the billionth ton of fuel at the autonomous republic's oilfields. A great river of oil is gathered from many thousands of ground capillaries and wells, the number of which constantly increases. Drillers of the celebrated Tuymazy field were of great service here. During the current five-year plan period they turned over new oil-bearing areas each year. [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 13 Jul 80 p 1] 11409

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